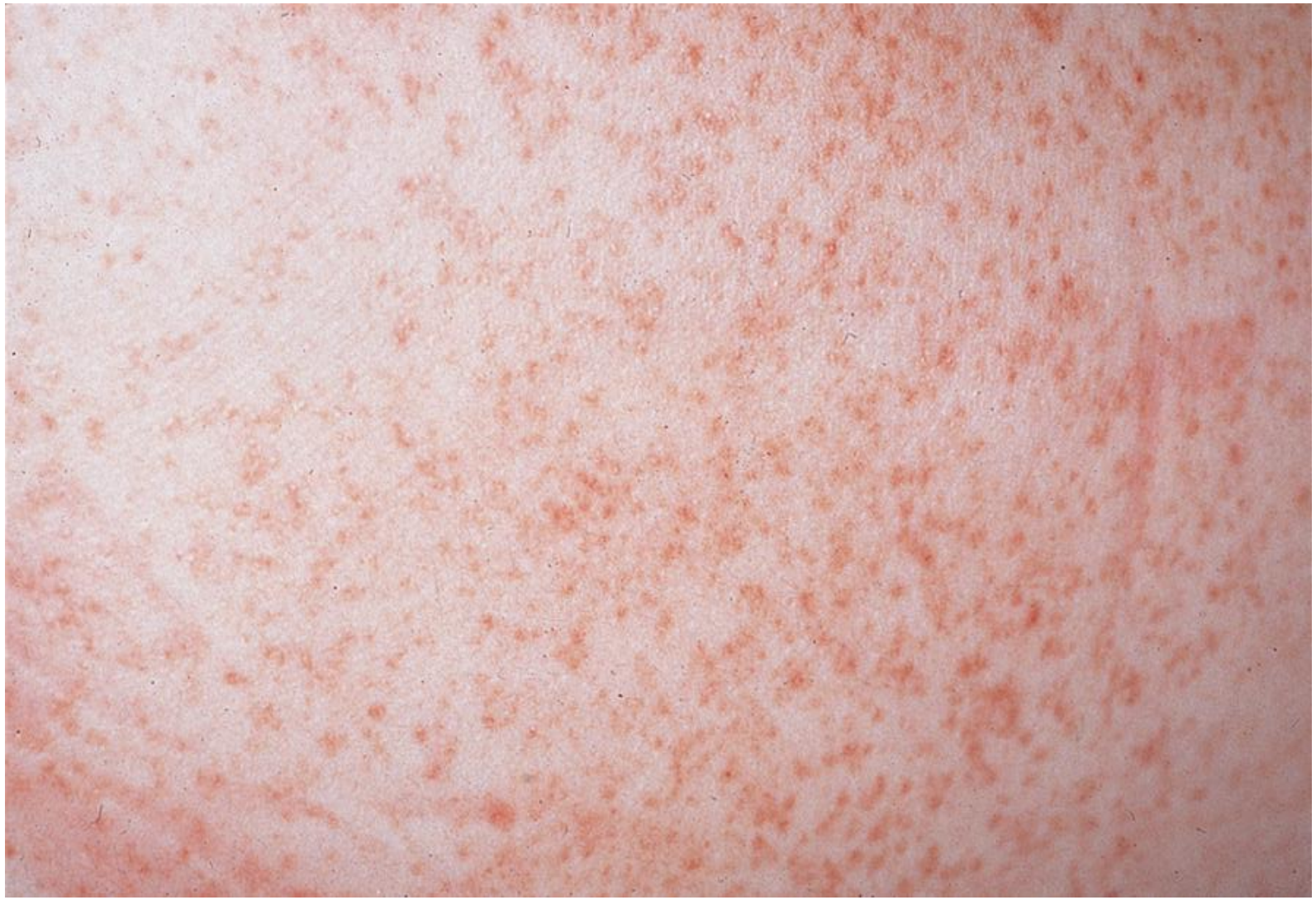
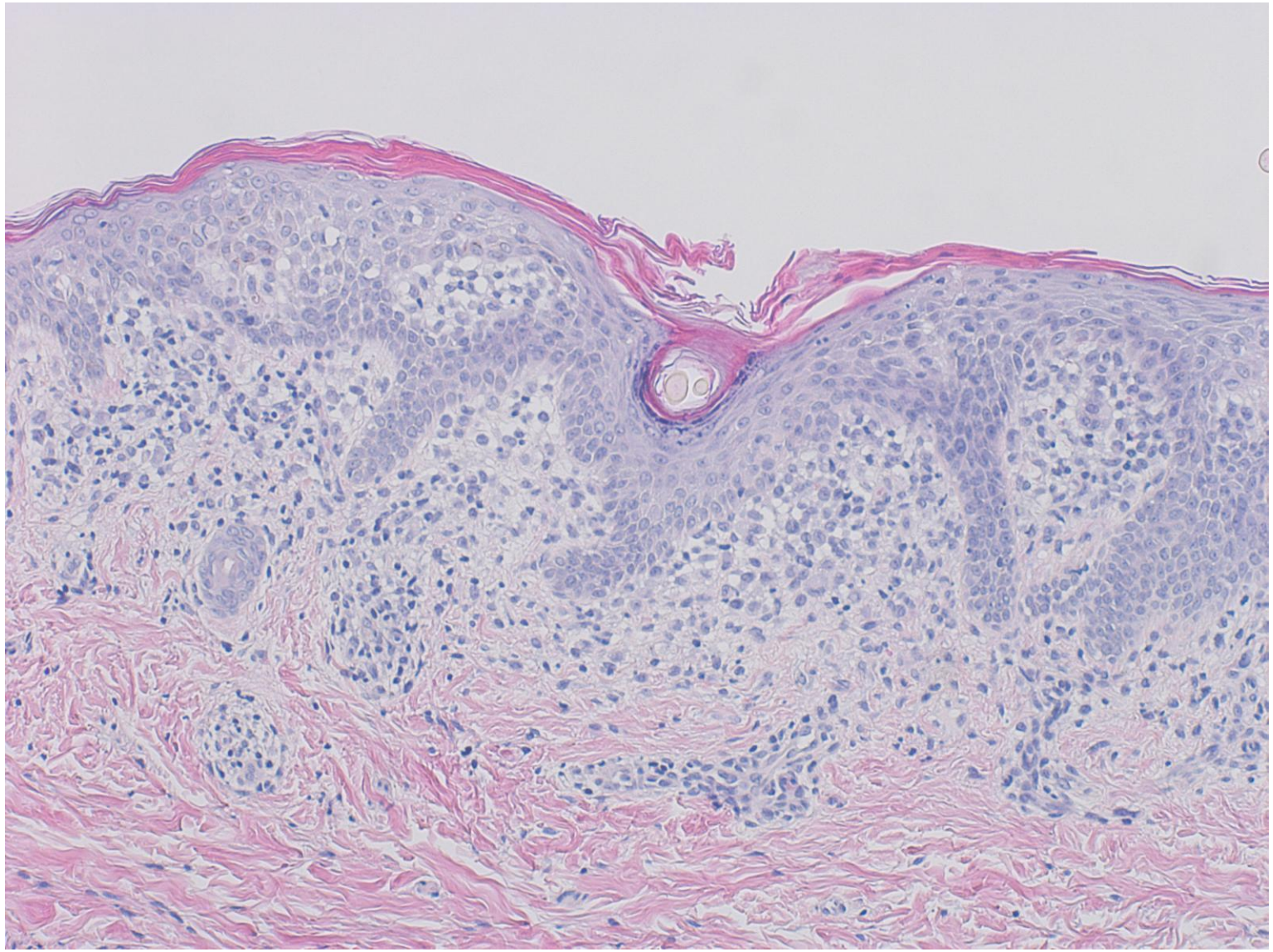
Letterer-Siwe disease (disseminated Langerhans cell histiocytosis)

Letterer–Siwe disease, the most severe disseminated form of Langerhans cell histiocytosis, exclusively occurs in children less than two years old. Multiple organ systems are involved, including the skin, bone marrow, spleen, liver, lung, oral cavity and gastrointestinal tract. The skin lesions are scaly seborrheic, eczema-like, or sometimes purpuric rashes mainly seen on the scalp, ear canals, trunk, neck or face. Microscopically, abnormal proliferation immature (atypical) Langerhans cells is observed. Immunohistochemically, S-100 protein, CD1a, langerin and CD207 are expressed in the neoplastic cells. Ultrastructurally, racket-shaped Birbeck granules are pathognomonic. Oncogenic mutations of BRAFV600E gene or less frequently MAP2K1 gene can be identified. As a malignant neoplasm, chemotherapy is indicated. The disease is often rapidly fatal, with a five-year survival rate around 50%.

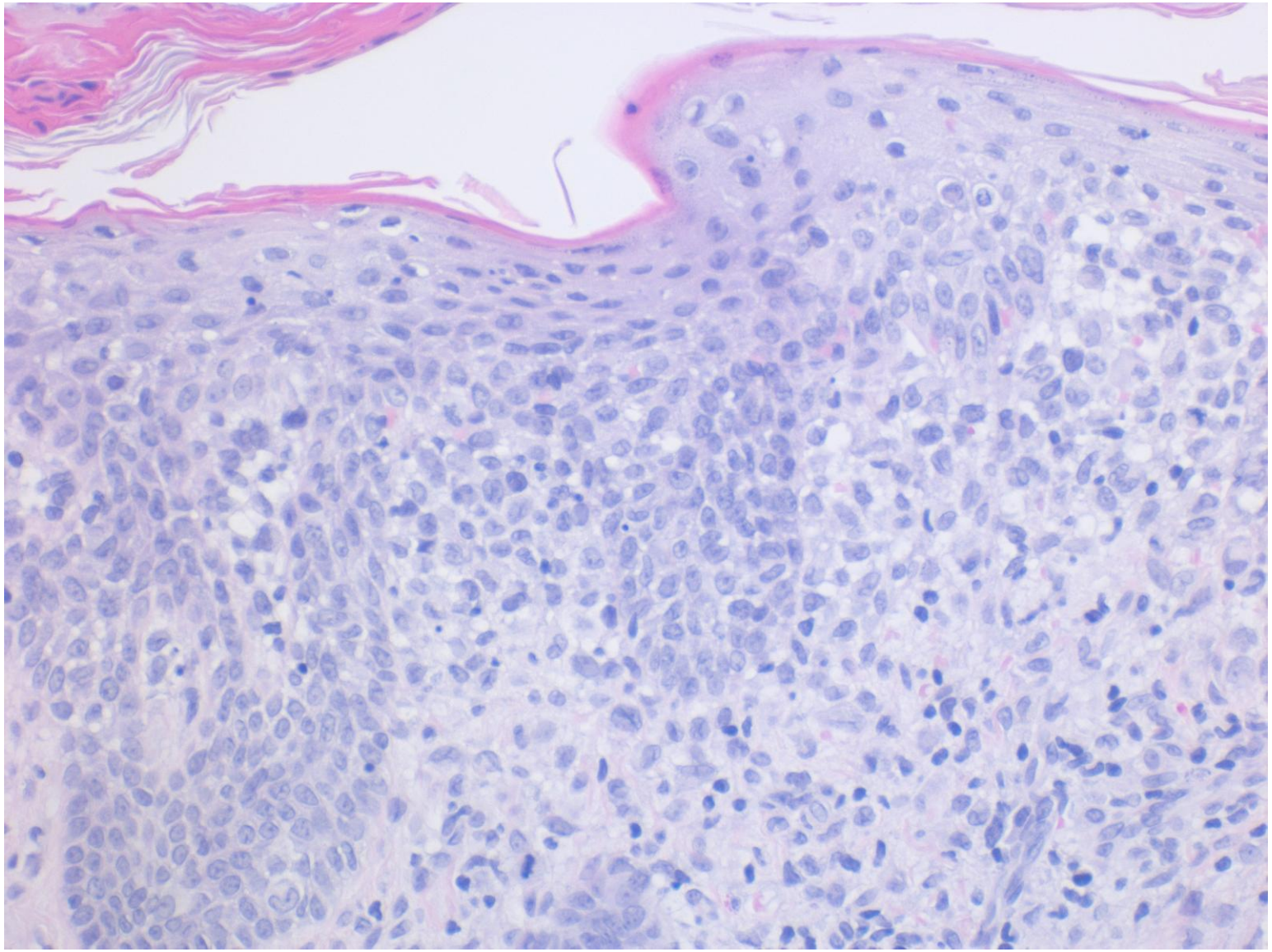
Ref.: Shanmugam V, Pozdnyakova O. Langerhans cell histiocytic neoplasms. PathologyOutlines.com website. 2025. https://www.pathologyoutlines.com/topic/lymphnodeslch.html



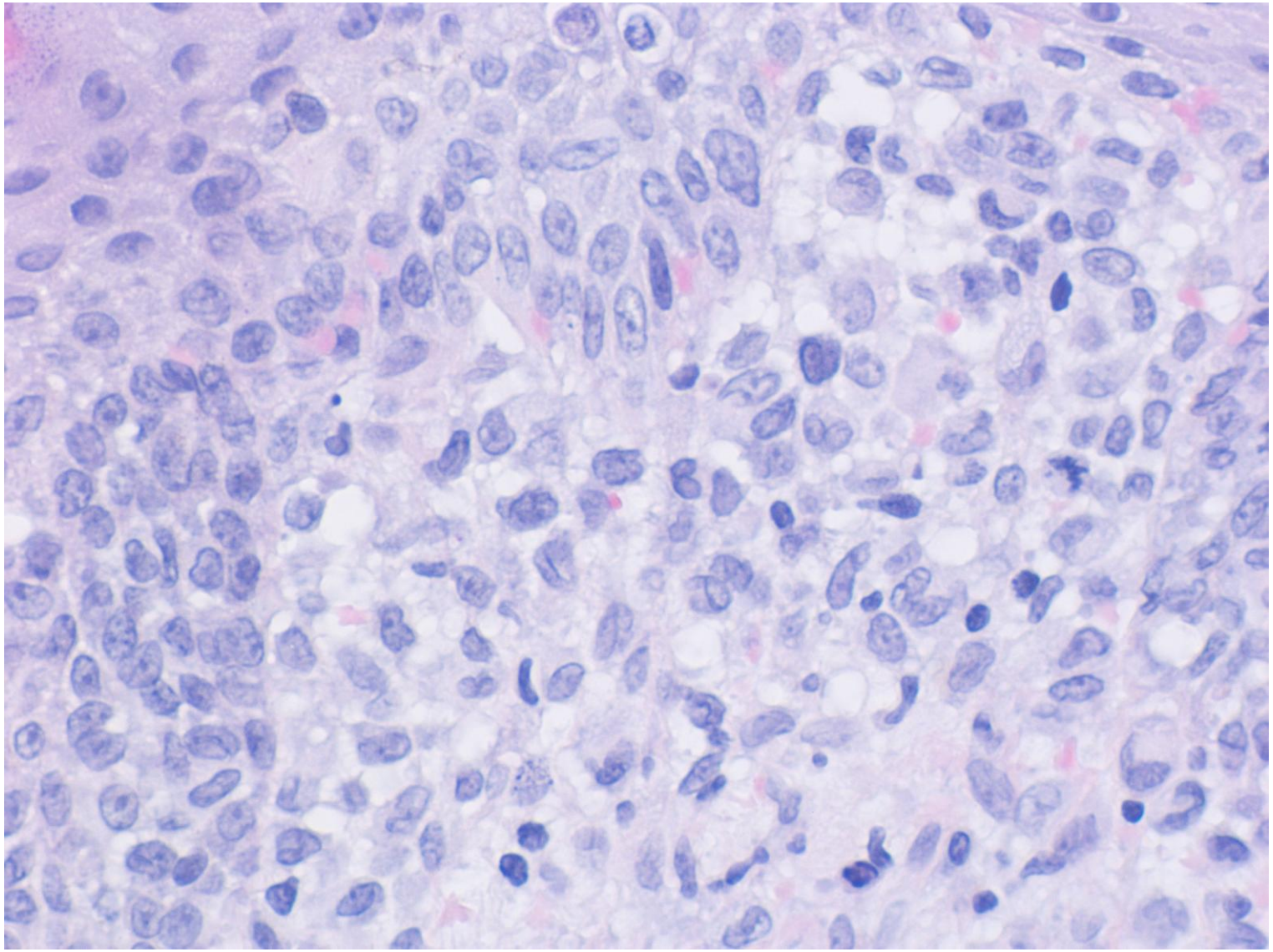
Letterer–Siwe disease seen in a 1 y-o girl. Multiple small purpuric rashes are seen on the back skin. Skin involvement is common as an initial sign.



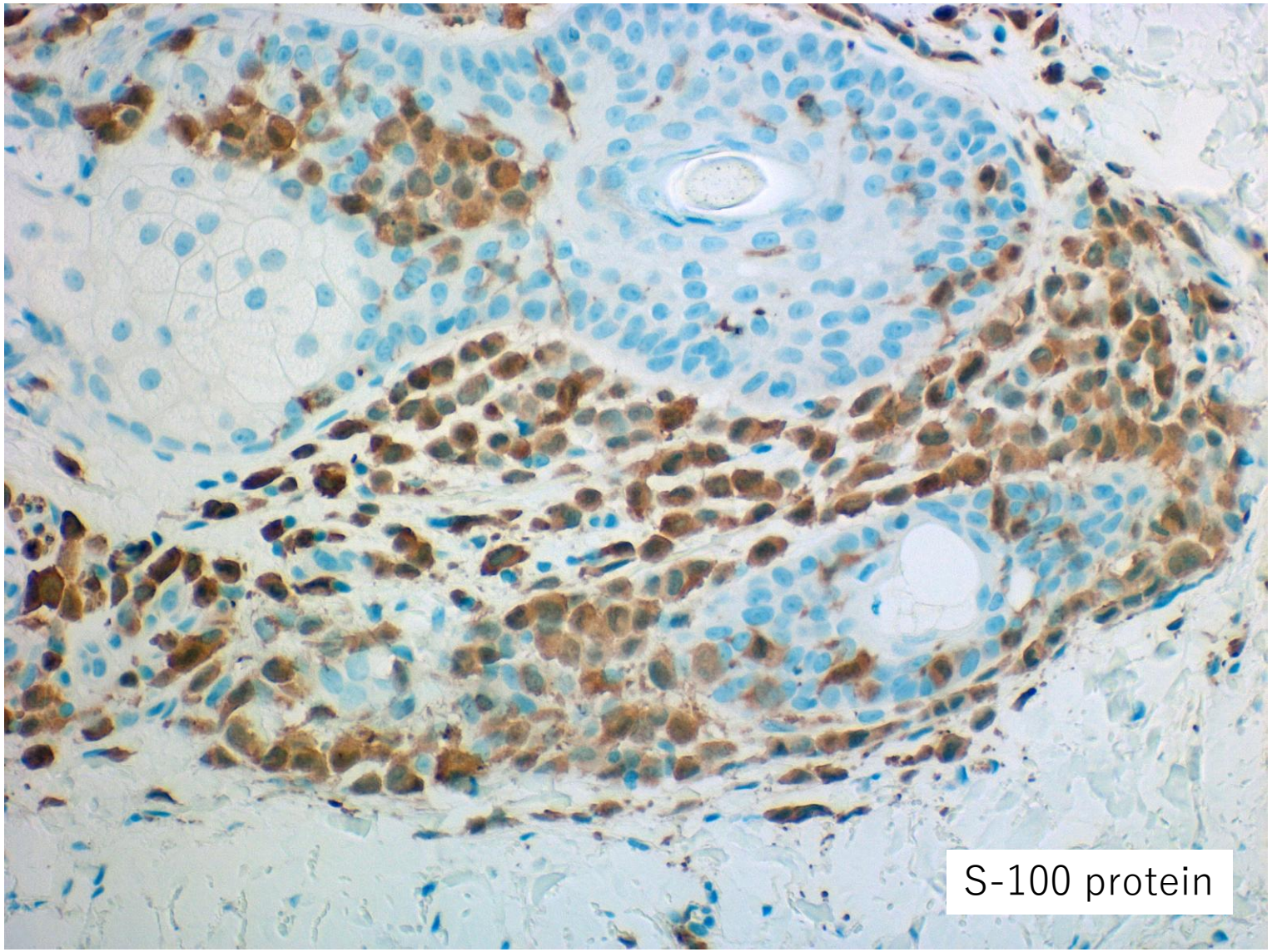
Letterer–Siwe disease seen in a 1 y-o girl. Skin biopsy reveals band-like monomorphous infiltration of mononuclear (histiocytic) cells in the upper dermis. The mildly acanthotic epidermis is focally involved (H&E-1).



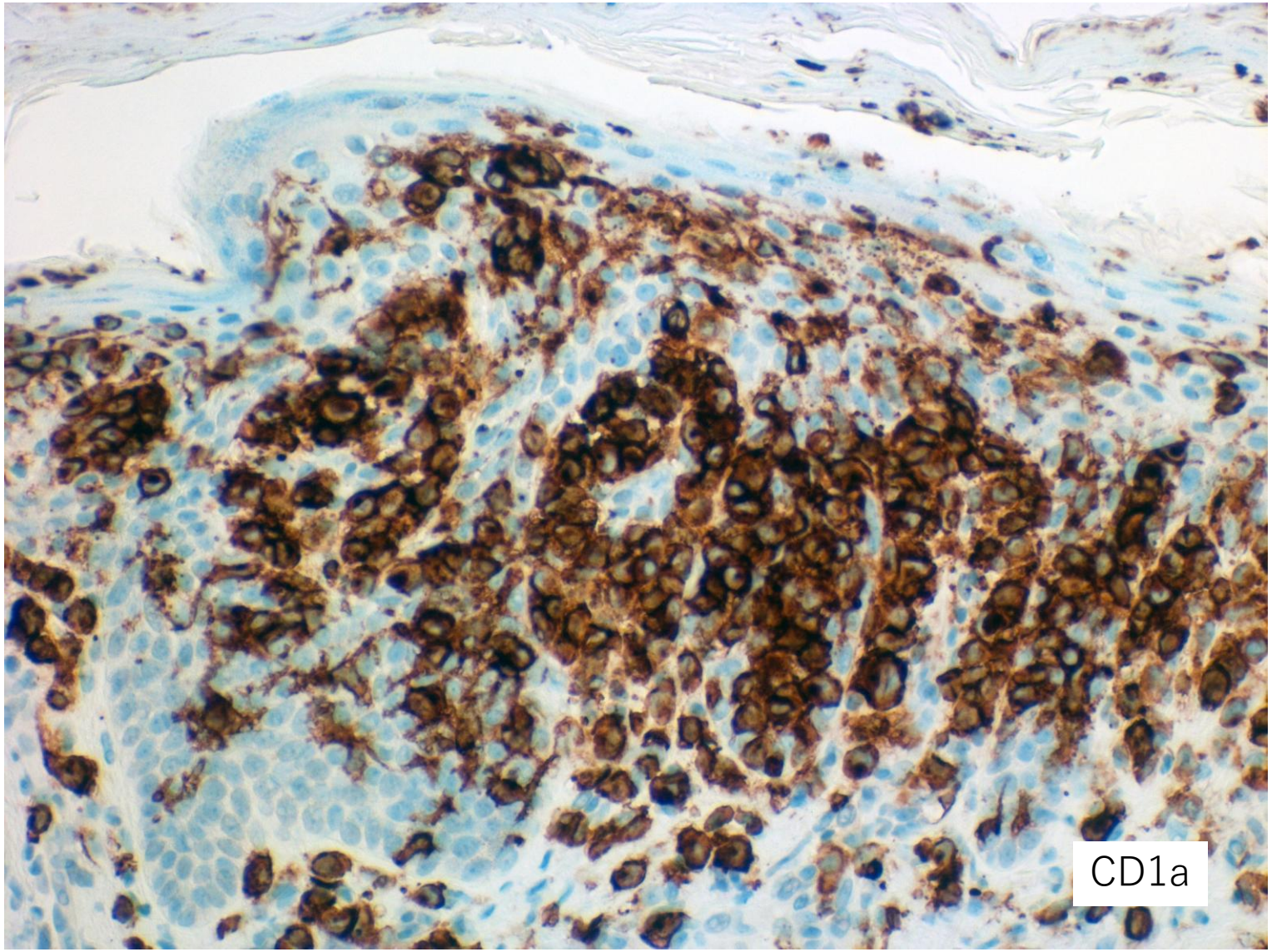
Letterer–Siwe disease seen in a 1 y-o girl. Skin biopsy reveals band-like monomorphous infiltration of mononuclear (histiocytic) cells in the upper dermis. The mildly acanthotic epidermis is involved by the histiocytic cells (H&E-2).



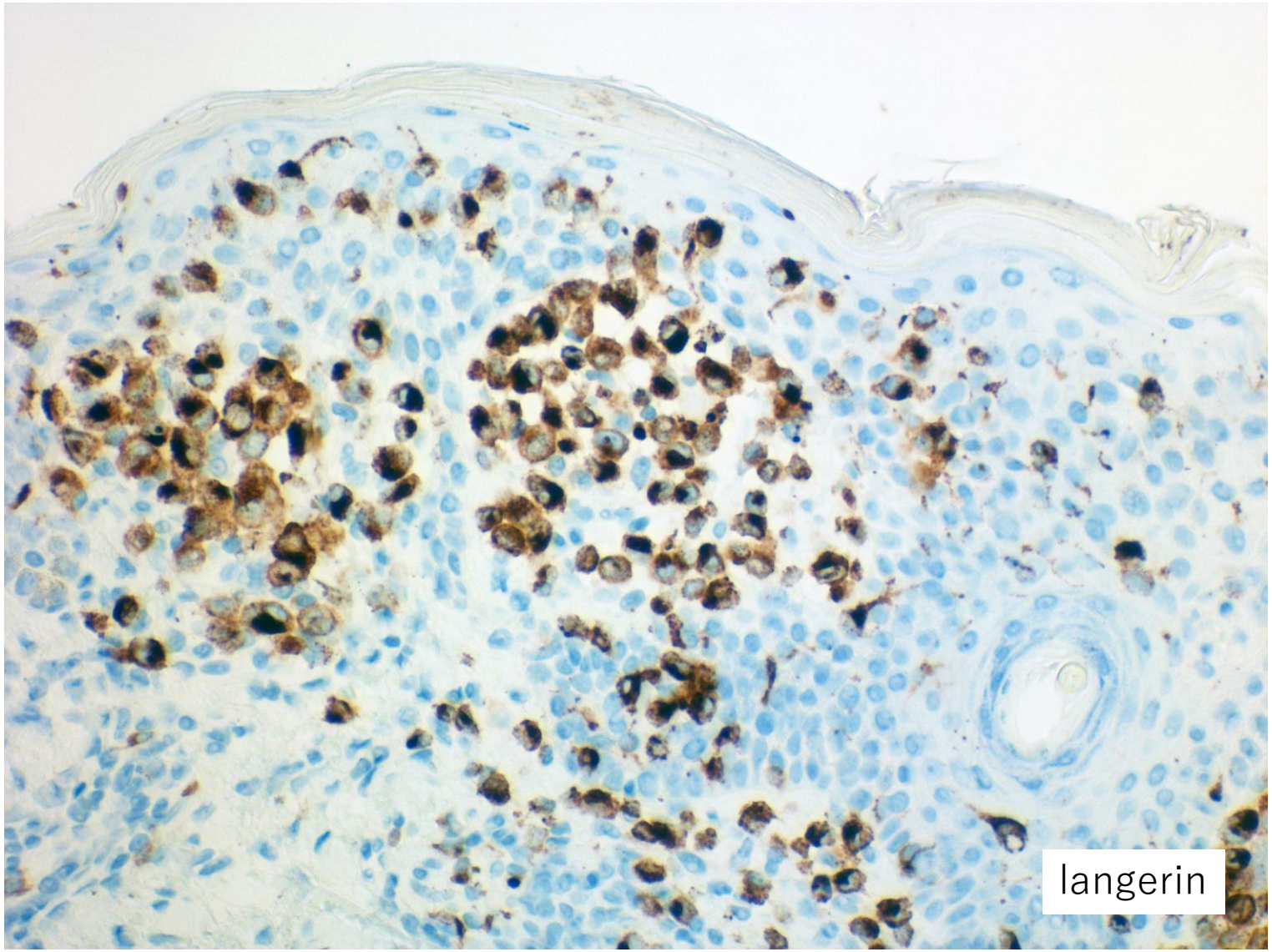
Letterer–Siwe disease seen in a 1 y-o girl. Skin biopsy reveals band-like monomorphous infiltration of mononuclear (histiocytic) cells in the upper dermis. Ovoid or indented/grooved nuclei and plump cytoplasm are recognized. Mitotic activity is scattered. No eosinophilic infiltration is seen (H&E-3).



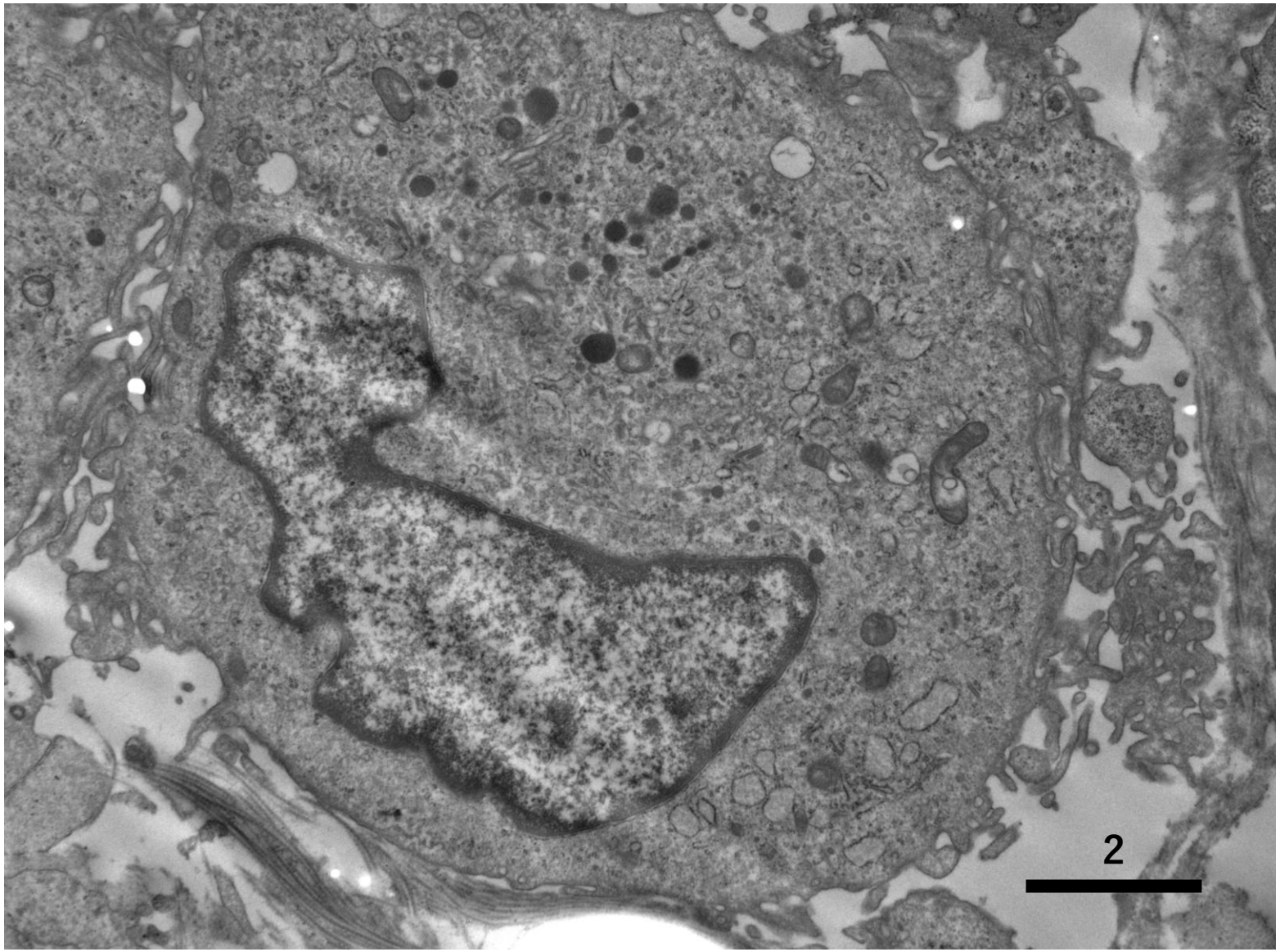
Letterer–Siwe disease seen in a 1 y-o girl. The monomorphous histiocytic cells in the upper dermis are immunoreactive for S-100 protein. Epidermal involvement is associated (immunostaining for S-100 protein).



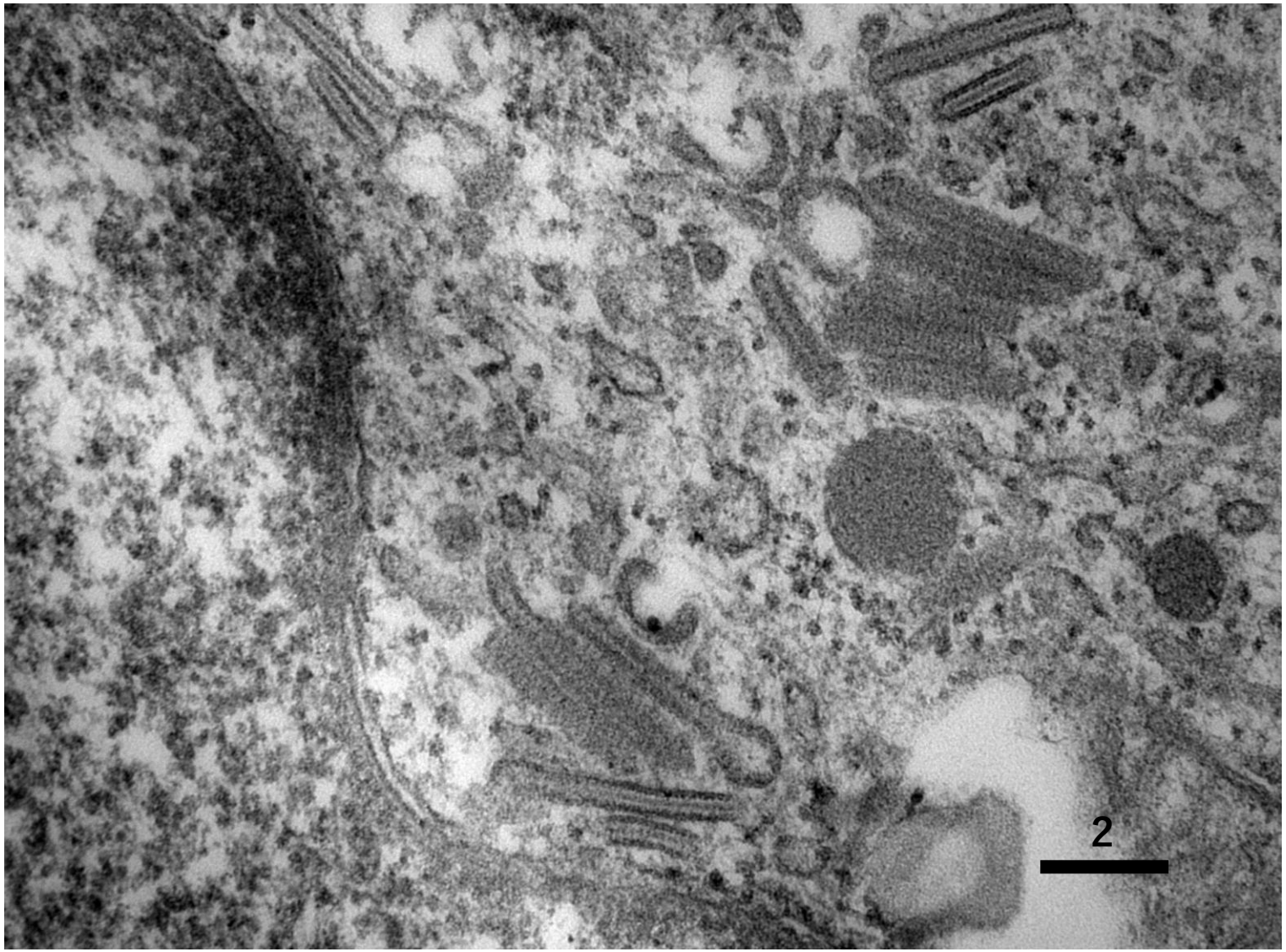
Letterer–Siwe disease seen in a 1 y-o girl. The monomorphous histiocytic cells in the upper dermis are immunoreactive for CD1a. Epidermal involvement is associated (immunostaining for CD1a).



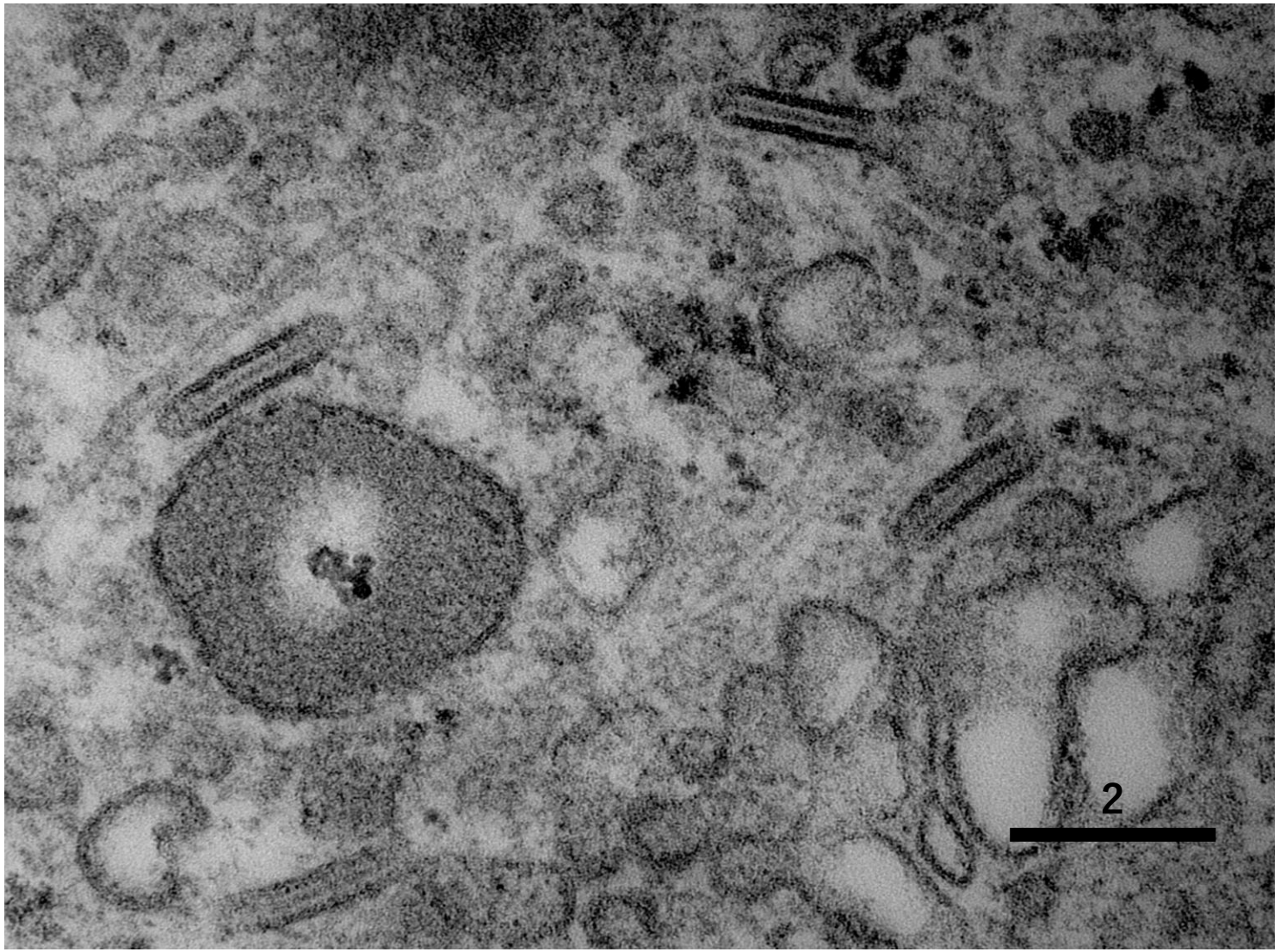
Letterer–Siwe disease seen in a 1 y-o girl. The monomorphous histiocytic cells in the upper dermis are immunoreactive for langerin. Epidermal involvement is associated (immunostaining for langerin).



Ultrastructure of Letterer–Siwe disease seen in a 1 y-o girl. The histiocytic cell shows foot-like cytoplasmic projections on the plasma membrane. Lysosomal granules are scattered in the plump cytoplasm. The nucleus is indented (TEM-1).



Ultrastructure of Letterer–Siwe disease seen in a 1 y-o girl. The histiocytic cell possesses Birbeck (Langerhans cell) granules. A central linear density with striated appearance is characteristic. Rackett-like formation is associated (TEM-2).



Ultrastructure of Letterer–Siwe disease seen in a 1 y-o girl. The histiocytic cell possesses Birbeck (Langerhans cell) granules. A central linear density with striated appearance is characteristic. Rackett-like formation is associated (TEM-3).